

of the Spoonbill, as Heer van Dyk, the former lessee of the Horster Meer is dead, and the present occupant was absent; but I would suggest to any ornithologist who may be in Holland in May or June that a week might be profitably spent in exploring the neighbourhood, where Bitterns, Savi's Warbler, and other rarities will probably be found breeding.

On our way home we spent a couple of days at Valkenswaard, a locality which, though formerly very rich in birds, seems to have recently deteriorated, owing to the numerous collectors who have been there. The only nest of special interest we procured was that of a Redstart, containing a Cuckoo's egg of unusual size and of exactly the same colour as that of the Redstart. Had it not been so much incubated that the foot of the young Cuckoo was plainly to be distinguished, the bird being alive, I could hardly have believed the egg to be genuine. Several similar eggs are in the collection of Herr Pralle, of Hanover, as Mr. Seebohm informs me, of which four were laid in one season, in the same locality, and all in Redstart's nests. The fact that the Cuckoo does lay blue eggs can therefore be no longer disputed; and it is probably the case (as Dr. Baldamus asserts, see *Ibis*, 1865, p. 178 *et seq.*) that the same Cuckoo lays eggs of a similar colour.

In concluding these hasty notes, I must express my hearty thanks to Mr. Benzon for the great kindness he showed us during our stay in Denmark, and a hope that he may shortly be induced to publish a paper in 'The Ibis' on the birds of Denmark, which, as a record of many years' experience, would be of permanent value to ornithologists.

XL.—*Remarks on the present State of the Systema Avium.*

By P. L. SCLATER.

[Concluded from p. 350.]

4. COCCYGES.

THE remaining families of Nitzsch's *Picariæ* (*i. e.* the Coc-

cygomorphæ of Huxley) stand associated together in our 'Nomenclator' under the name *Coccyges*, given to them by Sundevall in 1835 (K. Vet.-Ac. Handl. 1835, p. 69), and are divided according to the structure of their feet nearly after the plan suggested by Prof. Huxley (P. Z. S. 1867, p. 466). I fear, however, that this is not likely to be a permanent arrangement. Although we may not at once go to the length of following Prof. Garrod in separating the whole class of Birds into "Homalogonatae" and "Anomalogonatae," there can, I think, be no question that some weight must, in future, be allowed to the presence or absence of the ambiens muscle, and that it must be allowed that the Cuculidæ and Musophagidæ, in possessing this character and in other respects, stand *per se* among the Picariæ of Nitzsch, and show much affinity with the Gallinæ. I believe therefore that it will be better for the future to restrict the term *Coccyges* to these two families. The question then is, what shall we do with the remaining groups of the order? The arrangement of them by the structure of the feet, according to Prof. Huxley's scheme, although very simple, is not quite natural. *Leptosoma*, for instance (as I believe I first showed in 1865*), although the outer toe is more or less reversed, must certainly come near the Rollers (*Coraciidæ*); and *Colius* would now appear to be nearly related to the same group†, although its foot-structure is by no means similar. There seem in fact to be several different categories combined in the order *Coccyges* thus considered. First we have the *Lipoglossæ* of Nitzsch, consisting of the four families *Alcedinidæ*, *Bucerotidæ*, *Upupidæ*, and *Irrisoridæ*‡. These all belong to the *Piciformes* of Garrod§, and all the best authorities are pretty well agreed as to their consanguinity. Along with these must come the *Cuculinæ calopterae* or *Todidæ* of Nitzsch, containing also four families, which, to my mind, are also closely related—namely the

* P. Z. S. 1865, p. 682. Mr. Sharpe, in making the *Leptosominæ* merely a subfamily of *Coraciidæ* (*Ibis*, 1871, p. 285), appears to have entirely overlooked the structure of the feet.

† Cf. Garrod, P. Z. S. 1876, p. 416.

‡ Pterylography, p. 102.

§ P. Z. S. 1874, p. 117.

Meropidæ, Coraciidæ, Momotidæ, and Todidæ. The two last-named groups are united by Garrod into one family*. They all four have twelve tail-feathers, a naked oil-gland, and cæca. But to these must be added, as aberrant appendages (which sadly mar the uniformity of the group), the Leptosomidæ and Podargidæ and, as it would appear from Prof. Garrod's researches, the Coliidæ. *Leptosoma*, as stated above, is clearly more allied to the Rollers than to any other form. *Podargus* cannot be left with the Caprimulgidæ, looking to the conformation of its palatal bones†, and comes in best here, whereas *Nyctibius* belongs truly to the Caprimulgidæ‡. After Garrod's exhaustive disquisition on *Steatornis*§, we can no longer complain that its structure is unknown; but it becomes still more difficult, owing to its numerous peculiarities, to arrange this most extraordinary bird in a satisfactory place in the series. It must certainly be either put in here or placed as a separate order next to the Striges. Perhaps the former plan is for the present the most convenient.

With these additions the Anisodactylæ, as we have called them in our 'Nomenclator,' will consist of the following twelve families:—

- | | |
|----------------|---------------------|
| 1. Coliidæ. | 7. Momotidæ. |
| 2. Alcedinidæ. | 8. Todidæ. |
| 3. Bucerotidæ. | 9. Coraciidæ. |
| 4. Upupidæ. | 10. Leptosomidæ. |
| 5. Irisoridæ. | 11. Podargidæ. |
| 6. Meropidæ. | 12. Steatornithidæ. |

The Heterodactylæ, which follow next in the 'Nomenclator,' consist of the single family Trogonidæ, the only form of the whole class of birds in which the fourth or outer digit is reversed instead of the second. The pterylosis of *Trogon* is also quite different from that of the other Zygodactylæ, being purely Passerine, except as regards its long aftershaft||.

The true Zygodactylæ in the 'Nomenclator' consist of four families besides the Cuckoos, namely the Galbulidæ,

* See P. Z. S. 1870, p. 101.

† Huxley, P. Z. S. 1867, p. 445.

‡ Huxley, *l. c.* p. 454.

§ P. Z. S. 1873, p. 526.

|| Nitzsch, Pterylogr. p. 93.

Bucconidæ, Rhamphastidæ, and Capitonidæ. To these must be added the Indicatoridæ, which do not occur in the New World. *Indicator* has now been conclusively shown to have nothing to do with either the Cuckoos (as supposed by the older authors) or with the Woodpeckers (as believed by Blyth*), but must form a family of itself, allied to the Capitonidæ†.

Lastly, I would now propose to place together in one group, under the restricted title of "Coccyges," the two families Cuculidæ and Musophagidæ. I am not yet prepared to remove them to the neighbourhood of the Gallinæ altogether, but (as above stated) am ready to allow that Prof. Garrod has shown good reasons for separating them from the rest of the Zygodactylæ.

Moreover, on the whole, I have come to the conclusion that, looking to the successful assaults that have been made on Prof. Huxley's views as to the nature of the palate in the Pici and in the Trochilidæ, it will be a better arrangement to sink the Pici and Cypseli to the rank of suborders and to revive the term Picariæ for the whole of the three groups denominated in the 'Nomenclator' Pici, Cypseli, and Coccyges. The Order Picariæ may then be divided into the following six suborders:—

	Families.		Families.
1. Pici	2	4. Heterodactylæ ..	1
2. Cypseli	2	5. Zygodactylæ	5
3. Anisodactylæ	12	6. Coccyges.....	2

The Picariæ thus considered embrace altogether about 1600 species of birds referable, as shown above, to twenty-four families.

5. PSITTACI.

The Parrots (*Psittaci*), annexed by Cuvier and his disciples to the Zygodactylæ, are now generally allowed to form one of the primary divisions of the Carinatae, as was first, I believe,

* J. A. S. B. xi. p. 167 (1842).

† Cf. Slater, *Ibis*, 1870, p. 176. For the species of *Indicator* consult Sharpe in Rowley's *Orn. Misc.* i. p. 192, and *P. Z. S.* 1878, p. 793.

suggested by Nitzsch in 1829*. The affinities of this ancient group to other orders appear to be somewhat remote, but their most natural position seems to be between the *Picariæ* and the *Accipitres*. The best mode of subdividing this order has long been a matter of discussion, Dr. Finsch's mode of grouping, as well as those adopted by previous writers, being not very satisfactory. But a flood of light has been thrown upon this subject by Garrod's excellent memoir on the anatomy of the *Psittacidæ*†, and I think we may safely base our arrangement upon the results of his observations. This, indeed, I have already done in the last edition of the 'List of Vertebrated Animals living in the Zoological Society's Gardens' (1879), where I have arranged the *Psittaci* upon the following plan, of which the details are taken from Garrod's investigations:—

A. Left carotid normal.

A'. Orbital ring complete 1. *Cacatuidæ*.

B'. Orbital ring incomplete.

A''. Sternal keel aborted 2. *Stringopidæ*.

B''. Sternal keel developed 3. *Palæornithidæ*.

B. Left carotid superficial 4. *Psittacidæ*.

All the New-World Parrots belong to the last family.

6. STRIGES.

That the Owls, with so many peculiarities in their organization‡, should constitute an order separate from the *Accipitres* I think there is little doubt. There is no known intermediate form, unless it may be said that *Pandion* approximates rather to the *Striges* in the absence of the aftershaft. In a previous paper in this Journal§ I have given my reasons for dividing them into two families (*Strigidæ* and *Asionidæ*), which Prof. Newton|| and Mr. Sharpe¶ likewise agree to.

7. ACCIPITRES.

The *Accipitres*, which follow naturally next to the *Striges*,

* Obs. de *Avium* art. carotide communi.

† P. Z. S. 1874, p. 586.

‡ Cf. Nitzsch, *Pterylogr.* p. 67.

§ *Ibis*, 1879, p. 351.

|| Newton's *Yarrell*, i. p. 148.

¶ *Cat. Birds*, ii. p. 289.

are primarily divisible, as shown by Prof. Huxley*, into three families, which I have termed Falconidæ, Cathartidæ, and Serpentariidæ. Garrod goes much further than Prof. Huxley in distinguishing the two latter groups from the former†. The Cathartidæ he holds to be much more nearly allied to the Storks than to the Falconidæ, and *Serpentarius* (sive *Gypogeryanus*) he places, along with *Cariama*, among the Bustards. These two forms come in therefore in quite different parts of his "Systema." I confess I am not quite able to go so far as this, though I freely allow that the Cathartidæ (as already pointed out by Nitzsch, Pterylogr. p. 50) are in many respects very different from the rest of the Accipitres, and that the resemblance of *Serpentarius* and *Cariama* is most remarkable. But on the latter point Burmeister‡, no mean authority, has come to quite an opposite conclusion to Garrod. At any rate I see no justification for the course Mr. Sharpe has adopted (without stating any reasons) of placing *Cariama* among the Accipitres, still less for treating it as merely a genus of the subfamily Polyborinæ!

8. STEGANOPODES.

Although it is very easy to point out the defects in the arrangement of the remaining orders of birds (the Gallinæ, Grallatores, and Natatores) adopted by Cuvier and his disciples, it is by no means easy to suggest a better one. Let us first consider some of the weak points of the ordinary system. In the first place it is evident that the "*digiti palmati*," by which the Natatores are ordinarily characterized §, is a very slight and superficial character, and one of which no trace is to be found in the osteology. No one will now-a-days deny that the Gulls (*Gaviæ*), though their feet are webbed, are so intimately allied to the Waders (*Limicolæ*) that it is most unnatural to put the two groups far apart.

* P. Z. S. 1867, p. 462.

† Ibid. 1874, p. 117.

‡ "Beiträge z. Naturgeschichte des Seriema," Abh. nat. Ges. z. Halle, i. p. 11.

§ Even by Sundevall, who says "Nullo alio caractere opus est!" (Tentamen, p. 134).

Again, to divorce the Flamingoes from the Herons simply because of their webbed feet, seems by no means satisfactory. Nor is it easy to find any point of resemblance between the true *Anseres* and other *Natatores*, except the one single character of palmatipedism. Under these impressions I have thought it better to follow Prof. Huxley's plan of associating together the three great groups of *Grallatores* and *Natatores* that resemble the *Accipitres* in the formation of the palate. It appears to me that the great "Gallino-gralline" series runs off much more smoothly when these excrescences are removed, and that at the same time the three *Desmognathous* groups, even leaving the palatal conformation out of consideration, show much affinity *inter se*.

Acting on these ideas I placed the *Steganopodes*, *Herodiones*, and *Anseres* in the 'Nomenclator' immediately after the *Accipitres*, putting the *Steganopodes* first, amongst which the *Fregatidæ* show some sort of (at least superficial) resemblance to the birds of prey. I divided them into the following five families, which may, I think, be readily diagnosed:—

- | | |
|--------------------------|------------------------------|
| 1. <i>Fregatidæ</i> . | 4. <i>Phalacrocoracidæ</i> . |
| 2. <i>Phaethontidæ</i> . | 5. <i>Plotidæ</i> . |
| 3. <i>Pelecanidæ</i> . | |

9. HERODIONES.

The *Herodiones* (*Pelargomorphæ* of Huxley) come very naturally, I think, between the Pelicans and the Ducks. In the 'Nomenclator' they are divided into four families—*Ardeidæ*, *Ciconiidæ*, *Plataleidæ*, and *Phœnicopteridæ*. I have, however, lately come to the conclusion that the last-named group should not be included in the *Herodiones*, although, as Nitzsch has told us, the pterylosis is completely Stork-like, and occupies a middle place between *Ciconia* and *Tantalus*. Prof. Huxley says "the genus *Phœnicopterus* is so completely intermixed between the Anserine birds on the one side and the Storks and Herons on the other, that it can be ranged with neither of these groups, but must stand as a division by itself." In this opinion I am not quite disposed to agree, and propose to use Nitzsch's appropriate term "*Odontoglossæ*" to designate the order.

The family Plataleidæ, I may here remark, should include the Spoonbills and Ibises, as Nitzsch, who first constituted the group under the title Hemiglottides*, has shown. It is a common but very obvious error, well exposed by Garrod†, to unite the Ibises with *Tantalus*. But *Tantalus* is a true Stork, and has nothing to do with *Ibis*. The Plataleidæ differ from all the other Herodiones in being “schizorhinal”‡, in which respect they deviate towards the Limicolæ. But their pterylosis is that of the Storks, “even to the smallest details”§.

10. ANSERES.

The Anseres, if considered as limited to the single family Anatidæ, constitute a rather isolated group which can be very easily defined. Following Parker|| and Huxley¶ in the ‘Nomenclator’ I associated the Palamedeidæ with the Anseres. But after the recent investigation of Prof. Garrod** it would seem impossible to deny that the peculiarities of this group are such as to necessitate their recognition as a separate order, which I propose to call Palamedeæ. Nitzsch has long ago shown that the pterylosis of *Palamedea* is abnormal in showing scarcely any appearances of spaces between the feather-tracts (Pterylogr. pp. 16, 121); but in the Anatidæ, also, the spaces are very narrow.

The best position for the Palamedeæ appears to me to be just before the Anseres, which I commence with the genus *Anseranas*††.

11. COLUMBÆ.

We now enter upon the great Schizognathous series of Prof. Huxley, which, I think it must be allowed, runs on much more smoothly after the removal of the five preceding groups. The Columbæ are Passerine in many respects (especially as regards the state in which the young are excluded from the egg, which has caused Sundevall to place

* Pterylography, p. 133 (Engl. tr.).

† Garrod, P. Z. S. 1873, p. 37.

|| P. Z. S. 1863, p. 511.

** P. Z. S. 1876, p. 189.

† P. Z. S. 1875, p. 301.

§ Nitzsch, Pterylogr. p. 133.

¶ P. Z. S. 1867, p. 460.

†† See P. Z. S. 1880, p. 497.

them at the end of his division *Psilopædes**), and, no doubt, belong to a new line of departure from the *Passeres* towards the *Gallinæ*. It is very hard to have to mar the symmetry of the *Columbine* group by adding to it the *Pteroclidæ*. Yet there can be no doubt that in most respects the Sand-Grouse are more truly Pigeons than Grouse, and that the only way to escape from the dilemma is to recognize the *Pterocletes* as a separate order, as Prof. Huxley has proposed to do†, intermediate between the *Columbæ* and *Gallinæ*.

As regards the divisions of the *Columbæ* into families I have recognized two in the last edition of the 'List of Animals'—*Carpophagidæ* and *Columbidæ*. To these should have been added a third (*Gouridæ*) for the Crown Pigeons, in which the tarsi have a very peculiar conformation, and perhaps a fourth (*Didunculidæ*) for *Didunculus*.

The *Dodos* must be held to belong to quite a separate section of the order.

12. GALLINÆ, and 13. OPISTHOCOMI.

As regards the true *Gallinæ*, which we now come to, we cannot do better than adhere to Prof. Huxley's excellent division of them into *Peristeropodes* and *Alectoropodes*. In the former section I have recognized two families, *Cracidæ* and *Megapodiidæ*; in the latter two also, *Tetraonidæ* and *Phasianidæ*. Whether the *Meleagrines* and *Numidines* should stand as subfamilies of the *Tetraonidæ* (as arranged in the 'List of Animals' for 1879), or as separate families, is, I think, not quite certain. The *Turnicidæ*, there treated as only a family of the *Gallinæ*, as also *Opisthocomus*, must, I think, after Prof. Huxley's elaborate discussion of the subject‡, be definitely constituted as separate orders, *Hemipodii* and *Opisthocomi*—the former leading off towards the *Crypturi*, the latter most nearly allied to the *Cracidæ*, and also showing manifest signs of alliance with the *Coccyges* among the *Picariæ*.

* Tentamen, p. 97.

† P. Z. S. 1868, p. 254.

‡ P. Z. S. 1868, p. 311.

14. GERANOMORPHÆ.

In the 'Nomenclator' I have placed the Rails next after the Gallinæ, to which they show manifest symptoms of relationship, under Prof. Huxley's title Geranomorphæ*, and divided them into two suborders, for which I have used Nitzsch's names Fulicariæ and Alektorides. In the last edition of the 'List of Animals' (1879) I have added the Bustards and Cranes and considered these suborders as orders, which is perhaps the most natural plan, although *Aramus* is certainly intermediate between the two groups. After Prof. Garrod's investigations, however†, we must, I think, allow that *Aramus* is essentially more nearly allied to the Gruidæ.

The families of these two orders will therefore accordingly stand somewhat as follows:—

FULICARÆ.	ALECTORIDES.
Rallidæ.	Aramidæ.
Heliornithidæ.	Eurypygidæ.
	Gruidæ.
	—
	Psophiidæ.
	Cariamidæ.
	Otidæ.

By placing the Otidæ last we obtain a more gentle transition to the Limicolæ through *Ædicnemus*.

15. LIMICOLÆ.

The Limicolæ or Scolopacinae of Nitzsch (Charadriomorphæ of Huxley) form a very natural group with but small pterylographic differences. They also exhibit a characteristic form of skeleton and a well-marked type of schizognathous palate. In the 'Nomenclator' I have assigned the following families to this order:—

1. Ædicnemidæ.	4. Chionididæ.
2. Parridæ.	5. Thinocoridæ.
3. Charadriidæ.	6. Scolopacidæ.

* P. Z. S. 1867, p. 457.

† P. Z. S. 1876, p. 275.

Prof. Garrod* would exclude *Ædicnemus* (as being holorhinal) entirely from this order, and associate it with the Bustards (*Otis*). But if we give in to this principle we should have to place the Plataleidæ among the Limicolæ, which I cannot agree to.

16. GAVIÆ.

In the 'Nomenclator' I have made the Gaviæ to include the Petrels (Procellariidæ) as well as the Gulls (Laridæ). But I now think it better to restrict the term Gaviæ to the latter group, the Longipennes of Nitzsch, which, not only as regards their osteology, but also in respect of their pterylosis, come very near to the Limicolæ†.

The Gaviæ will therefore consist of the single family Laridæ, while the Procellariidæ will constitute the order "Tubinares" (Nitzsch). The propriety of this separation is confirmed by what Prof. Garrod has stated (P. Z. S. 1879, p. 37) as to the form of the nasal bone in these two groups.

17. PYGOPODES, and 18. IMPENNES.

The Pygopodes of Illiger combine the two families Colymbidæ and Alcidæ, which are also closely allied pterylographically. They seem to form a natural transition between the Gaviæ and the Impennes. Nitzsch (Pterylogr. p. 151) has associated them with the latter group; but the Penguins are very distinct not only in their osteology, but also in their pterylosis, as admitted by Nitzsch himself, and have full claims to constitute an order *per se*.

19. CRYPTURI.

Under this term (of Illiger) I have placed in the 'Nomenclator' the Tinamidæ, which, as Mr. Parker has shown (Trans. Zool. Soc. v. p. 149), have a completely struthious palate, and in other respects come at the bottom of the series, and are nearest of all Carinate birds to the Ratitæ. In so doing I make, of course, no claim to originality, but have

* P. Z. S. 1873, p. 37.

† Cf. Nitzsch, Pterylogr. p. 141; and Huxley, P. Z. S. 1867, p. 458.

simply followed Prof. Huxley, who first located the Tinamous in their position under the title “*Dromæognathæ*”*.

20. APTERYGES, and 21. STRUTHIONES.

In the table given in the ‘*Nomenclator*’ (p. iv) I have recognized only two orders of Ratite birds—Apteryges and Struthiones. But there is no doubt, I think, that the Casuaries have full claim to ordinal rank, and should likewise stand as an independent order. Their very peculiar pterylosis, apart from their marked osteological differences from *Struthio* and *Rhea*, would alone entitle them to this distinction. I would therefore propose to designate them Casuarii, the simple Latin plural being, in my opinion, a better term for the group than any name which would be a fresh burden on the memory.

Amending the “*Systema*” according to the suggestions above made, we shall find it come out in two subclasses and twenty-six orders, somewhat as in the following table, where I have added to the name of each order about the number of species known to belong to it, basing my calculations mainly on the figures given in the second volume of Mr. Wallace’s ‘*Geographical Distribution*.’

Orders of existing Birds.

Subclass CARINATÆ (10,121 species).

I. Passeres	5700	XIII. Gallinæ	320
II. Picariæ	1600	XIV. Opisthocomi	1
III. Psittaci	400	XV. Hemipodii	24
IV. Striges	180	XVI. Fulicariæ	150
V. Accipitres	330	XVII. Alectorides	60
VI. Steganopodes	60	XVIII. Limicolæ	250
VII. Herodiones	130	XIX. Gaviæ	130
VIII. Odontoglossæ	8	XX. Tubinares	100
IX. Palamedææ	3	XXI. Pygopodes	65
X. Anseres	180	XXII. Impennes	20
XI. Columbæ	355	XXIII. Crypturi	40
XII. Pterocletes	15		

* P. Z. S. 1867, p. 125.

Subclass RATITÆ (18 species).

XXIV. Apteryges.....	4
XXV. Casuarii	10
XXVI. Struthiones	4

In concluding these somewhat desultory remarks I must beg my fellow workers not to suppose that I claim any originality for the system above given. It having been a necessity for me to employ *some* system in certain pieces of work (such as the 'Nomenclator' and the various catalogues of animals in the Zoological Society's Gardens), I have endeavoured to frame one that is free from certain objections which are patent in the systems usually followed. It will be seen at once, by those who care to examine the references above given, that I have borrowed freely from the labours of Nitzsch, Huxley, Sundevall, Parker, and Garrod—authors who have lately shed a flood of light upon one of the most difficult zoological problems of the day, the best arrangement of the class of birds. My system is, in fact, that of Prof. Huxley's reversed, *i. e.* beginning at the top instead of the bottom, with slight alterations and emendations extracted from the works of the other authors above mentioned.

XLI.—*Henry Durnford's last Expedition to Tucuman and Salta.*

(Plate XII.)

[THE following is an almost verbatim copy of the diary of the late Henry Durnford, to which allusion was made in our July number. Some difficulty has been experienced in the matter of orthography, more especially as regards the names of places, but every care has been taken to avoid mistakes.]

MAY 14, 1878. Left the Central Station (Buenos Ayres) at 2 P.M. for Campana. During the journey saw most of the birds one sees on this route, *i. e.* *Ciconia maguari*, *Larus cirrhopcephalus*, and Ducks of many kinds, Spoonbills, a few Swallows (*Hirundo leucorrhoa*), *Lichenops perspicillatus*, &c. The opening of the Campana Railway has done a great deal towards fostering agriculture, and many acres of land pre-